



# Office of Deactivation & Decommissioning/Facility Engineering Quarterly Newsletter

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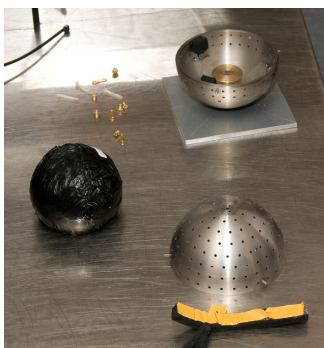
## Deactivation & Decommissioning

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### RadBall: Deployable Radiation Mapping Device Reduces Worker Exposure

A new technology to expedite initial characterization of radiologically contaminated facilities in a safer manner, RadBall, has been developed by the United Kingdom's National Nuclear Laboratory (NNL). RadBall is a deployable softball sized gamma radiation mapping device that, from a single location, can locate and quantify radiation hazards within a given area. Consisting of a colander-like outer shell that houses a proprietary radiation-sensitive polymer sphere, the RadBall can be positioned in a radioactive area and left alone to collect radiation exposure data. When exposed to radiation, the polymer develops unique "tracks" with depth relative to the amount of radiation; the higher the radiation, the deeper the tracks. In addition, the position of the tracks indicates the location and direction of the sources.

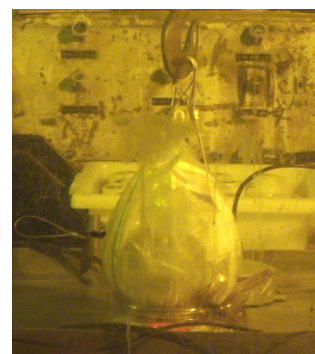


RadBall Components - The polymer sphere and outer shell of the RadBall before assembly.

Currently, Savannah River National Laboratory (SRNL), through work authorization funding by the Office of Deactivation & Decommissioning/Facility Engineering (D&D/FE), is evaluating this new radiation detection technology for use in performing the initial characterization of glove boxes, hot cells, and other high radiation environments. Earlier rounds of testing were performed in an instrument calibration laboratory at the Savannah River Site to determine the optimal level of radiation exposure for the device and in early September 2009, the RadBall technology was demonstrated in

contaminated Hot Cell 9 in Building 773-A at SRNL.

The SRS irradiated RadBalls were then sent to Duke University Medical Center (Duke) for further evaluation using the Center's state-of-the-art Optical Computed Tomography (CT) scanner. The polymer constituent of the RadBall device is also used in the medical field to make phantoms, which are used by medical physicists to model radiation dose delivered to a cancer tumor during radiation therapy. Duke has been studying the reliability and accuracy of the polymer phantoms. Therefore, the evaluation of RadBalls irradiated at SRNL will provide Duke with additional data on the polymer, while providing SRNL and DOE information on the sources of radiation and exposure levels in Cell 9 at SRNL. Further, the data obtained by the CT scanning has been

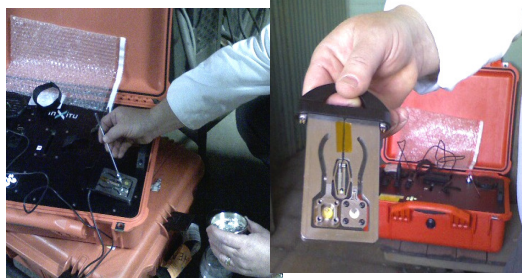


RadBall Hot Cell Demonstration - the RadBall, in a protective bag to prevent contamination, is being placed in a contaminated hot cell at SRNL.

sent to the NNL to develop the visualization (3-D characterization) of Cell 9. The further development and deployment of the RadBall provides an ability to greatly reduce personnel exposure pathways from manual radiological scans.

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## Field Testing of Real-Time, Portable/Transportable Asbestos Detection Instruments



The Office of Deactivation & Decommissioning and Facility Engineering (D&D/FE) initiated technology studies with MSE Technology Applications, Inc. to identify commercially available portable/field-deployable/transportable asbestos detection technologies which can effectively determine the presence, or lack of, asbestos in building materials thus helping to expedite facility surveys. This is particularly important because the National Emissions Standards for Hazardous Air Pollutants (NESHAP) requires removal of all regulated asbestos containing materials (ACM) prior to D&D of facilities. Examples of ACM include: sprayed-on

fireproofing, asphalt and vinyl floor tile, and transite siding that exceed threshold quantities. The availability of such detection technologies will greatly minimize the need to conduct time-consuming bulk sampling and the sample analysis at a certified analytical lab, thereby greatly enhancing worker safety, reducing costs, and minimizing secondary waste.

Five technologies were evaluated at bench-scale, with the *Alpha X-Ray Fluorescence Spectrometry Unit* by Innov-X Systems; the *Terra X-Ray Diffraction Spectrometry Unit* by InXitu, Inc.; and the *PHAZIR Diffuse Reflectance Near-Infrared Spectrometry Unit* by Polychromix being

selected for field demonstration at asbestos-contaminated sites in Butte, MT and at the Oak Ridge National Laboratory Building 2018. These technologies were able to detect asbestos concentrations of 3% or more about ninety per cent of the time. These results demonstrated that commercially-available field instrumentation is available for the direct semi-quantitative identification of ACM. To allow regulatory acceptance, further work needs to be done to develop instrument-specific calibration models to improve asbestos detection at or near the regulatory level of 1% in a wide variety of materials.

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## Prioritization Tool for Surveillance and Maintenance (S&M) Investment in Excess Facilities

DOE currently faces a daunting task in maintaining hundreds of aging excess facilities that are scheduled for demolition. Prioritization of maintenance activities and allocation of resources is difficult when balancing the needs of multiple active facilities against the needs of current and future excess facilities. Experience has shown that inadequate investment in maintenance of excess facilities can result in a significant increase in D&D costs when facilities deteriorate, especially to the point where they are unsafe for human entry.

To help address these issues D&D/FE tasked Florida International University, in collaboration with the Oak Ridge National Laboratory (ORNL), to develop the *Prioritization Tool for S&M Investment in Excess Facilities (Tool)*. This flexible computer-based decision support tool can help facility S&M managers effectively prioritize maintenance expenditures in excess facilities.

The Analytical Hierarchy Process used by the Tool calculates the weight of importance of defined risk criteria and general S&M activities by means of a pairwise comparison to rate the

importance of these activities to each other. Excess facilities can be evaluated against risk criterion — combining the outcome with the weight of importance of S&M actions required by a facility. This results in an overall rank of S&M activities that is based on the importance of the activity and the risk posed by a facility. This method, which is being used at ORNL, addresses the needs of all excess facilities without ignoring maintenance actions in lower-ranking facilities, thus preventing them from becoming a higher risk in the future.

The Tool is flexible and can be modified for use at any site to help facility S&M managers effectively use their budgets on those maintenance actions that will maintain facility safety prior to demolition. The User's Guide and spreadsheet template - "the Tool," are available and downloadable from the D&D Knowledge Management Information Tool web site at <http://dndkm.org>.

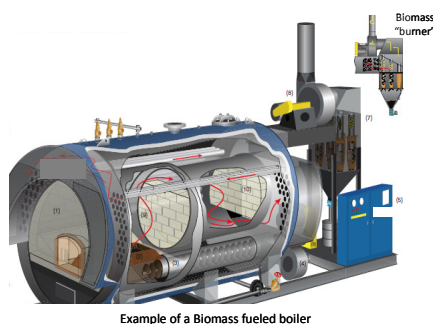
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## Energy Management Initiatives (EMI)

### DOE's Savannah River Site Continues to Strive for Cleaner Energy Efficient Utilities

Construction is underway on three new biomass plants at the Savannah River Site (SRS). Two of the new energy-efficient plants are designed to provide up to 10,500 lbs/hr steam for facility heating and are expected to be operational in late 2010. The third biomass plant is a cogeneration facility with a design capacity of 240,000 lbs/hr steam and 20 megawatts (MW) electrical power and is expected to be operational in late 2011. The facilities are being constructed with third-party financing under a \$183 million dollar Energy Savings Performance Contract (ESPC). The project will replace an inefficient coal powerhouse in D-Area and oil-fired boilers in K-Area. SRS is building on its successful completion of a smaller biomass plant in September 2008 that currently contributes to EM's renewable energy and energy intensity goals. The

new ESPC project will provide reliable steam for critical site missions and significantly contribute to the energy intensity and renewable energy goals outlined in Presidential Executive Orders 13423 and 13514 and the Energy



Policy Act of 2005. EM's 20MW SRS biomass cogeneration plant - using renewable sources - will provide 20-25% of the site's entire electricity use, exceeding the federal goal requiring federal agencies to use or generate at least 7.5% renewable energy by 2013. The new biomass plants at SRS demonstrate DOE's commitment to the new administration's desire for cleaner, energy efficient utility use.

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## Real Property Asset Management (RPAM)

### Streamlined Process Expedites Property Transfers

A new streamlined property transfer process developed by D&D/FE supports the Office of Environmental Management's goal of reducing cost, completing cleanup activities faster, and returning assets to the surrounding communities. EM streamlined its process for transferring to the private sector underutilized property at defense nuclear facilities under 10 CFR 770, *Transfer of Real Property at Defense Nuclear Facilities for Economic Development*. Headquarters reviews that once took up to 12 months can now be completed in as little as three months. The previous lengthy process was the result of the large number of memos and letters that needed to be prepared, the number of sequential reviews, and the preparation of the required congressional notifications.

In the new process, the Field Office prepares all the documents for the property transfer package (memos, environmental documents, regulatory approvals, maps) including the congressional notification letters for the Secretary's signature. The Field Office then transmits this complete land transfer package to headquarters (electronically and in hard copy) where the package is forwarded to the members of the Property Transfer Review Team for concurrent reviews not to exceed two weeks. The Review Team includes the Offices of Environmental Management, General Counsel, Chief Financial Officer, Management, and Congressional and Intergovernmental Affairs.

*A streamlined property transfer process — accelerates EM's footprint reduction efforts — supports new economic opportunities for local communities*

At the conclusion of the two-week review period, the Office of Management schedules and hosts a meeting of the Review Team to resolve any concerns. Once consensus is reached, and the package is revised as necessary, the Office of the Chief Financial Officer forwards the package to the Office of Management and Budget (OMB) for approval. EM then submits the package containing the Congressional Notifications to the Secretary for signature and delivery to the congressional committees. The headquarters process takes approximately 30 days and the Field Office can complete the property transfer after the congressional notification period. The new streamlined property transfer process helps to accelerate EM's footprint reduction efforts, while supporting new economic opportunities for local communities.

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## U.S. Department of Energy



D&D/FE IS ON THE WEB AT - [HTTP://WWW.EM.DOE.GOV/EM20PAGES/DDFE.ASPX](http://www.em.doe.gov/EM20PAGES/DDFE.ASPX)

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### Technical Assistance: The Staff Knowledge Directory

The D&D/FE staff members represent a knowledge-base available to help assist projects in identifying solutions with technical assistance across a wide-range of Deactivation and Decommissioning (D&D) and Facility Engineering (FE) topics. The following listing is a sampling of knowledge areas and contact information.

**James Antizzo—**

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D&D — Geology: environmental sciences, environmental regulations, energy parks initiative

**George Cava (P.E.)—**

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D&D — Mechanical Engineering: Ocean Engineering: program & project management, D&D guidance & planning, External Technical Reviews (ETRs)

**Dares Charoenphol (P.E.)—**

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D&D — Civil Engineering: engineering design, construction, and cost estimating; business and project management; transportation

**John De Gregory—**

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FE — Electrical Engineering: knowledge management; information research & management; robotics and remote systems; communications

**Wilfred Figueroa—**

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D&D — Mechanical Engineering: project scheduling; project management; ETRs

**Donna Green—**

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FE (*Lead*) — Chemical Engineering: Land Transfer; Energy Management Initiative; Real Property Assets Management

**Stephen Lien (PhD)—**

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[301-903-0114]

D&D — Biochemistry: grant management; SBIR's; sensors & instrumentation

**Don Mackenzie—**

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D&D — Health Physics: ETRs; radiation protection; ALARA controls

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FE — Electrical Engineering: electrical power distribution system planning, design, operations, & maintenance; Ten Year Site Plans; Real Property Asset Management

**Charles Nalezny (PhD)—**

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FE — Civil Engineering: Property Transfer; ETRs

**Adam Pugh (EIT)—**

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FE — Architectural Engineering: Facilities Information Management (Mgmt.) System (FIMS); Real Property Asset Management (RPAM); Condition Assessment Information System (CAIS)

**Andrew Szilagyi—**

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D&D — Environmental Sciences: D&D policy, guidance, and planning; end-points methodology; program/project management

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FE — Mechanical Engineering: Energy, Water, and Transportation Mgmt.; Leadership in Energy and Environmental Mgmt. (LEED); Transformational Energy Action Mgmt. (TEAM) Initiative

**Alexander Williams (PhD)—**

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D&D — Chemistry: Radiation Protection & Monitoring; Radiological Cleanup Criteria (RESRAD); radionuclide chemistry, surveys, and procedures



**EM Environmental Management**

safety ♦ performance ♦ cleanup ♦ closure

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